MICROLITHS USE IN WESTERN MEDITERRANEAN DURING VI-V MILLENNIUM BC

Niccolò Mazzucco, Bernard Gassin**, Juan Francisco Gibaja*, Antoni Palomo**

Abstract: Geometric microliths have been often considered as an important cultural and chronological marker for the study of lithic assemblages, especially for European Mesolithic and Neolithic. However, systematic studies on microlith function are still lacking. In this paper we present a synthesis of microwear analysis realized on a number of sites, in Western Mediterranean, dated between the VI-V millennium. Our objective is to investigate the significance and the recurrence of those instruments within a spectrum of different contexts. Results indicate that, within a global tendency for microliths use as hunting weapons, there is a certain degree of variability on the basis of environmental, economical and cultural factors that strongly influence their production and mode of use.

Key Words: Microwear analysis, Microliths, Western Mediterranean, Geometric, Neolithic.

Resumen: *Los microlitos geométricos han constituido un referente cronológico y cultural en relación al utillaje lítico de los contextos mesolíticos y neolíticos del occidente mediterráneo. Todavía estudios sobre la funcionalidad de estos instrumentos durante el Neolítico, aún son raros. En esta comunicación presentamos el uso al que destinaron estos instrumentos las primeras comunidades neolíticas asentadas en el Occidente mediterráneo entre el VI-V milenio. Nuestro objetivo es lo de investigar el papel que estos instrumentos jugaron en relación a las actividades que se realizaban en los asentamientos. Los resultados nos indican que, por cuanto sus uso como proyectil sea el mayoritario, las condiciones ambientales, el régimen económico y el ámbito cultural, influyen considerablemente sobre sus producción y sus modalidad de uso.*

Palabras clave: *Análisis funcional, microlitos, geométricos, Occidente mediterráneo, Neolítico.*

Introduction

Microliths are one of the most representative elements in lithics studies. Those instruments have been globally considered, since the pioneer studies (Barrière 1956; Tixier 1963; Bordes and Sonneville-Bordes 1970; Fortea 1973), one of the guide fossil in the determination of chronological phases and cultural units in prehistory. Traditionally those studies have been based on the analysis of some morphometrical and stylistic patterns, which variation permitted to identify specific morphologies, thus interpreted to represent distinct cultural or ethnic communities and the relative influences between them. However, until now, even if great attention has been paid to microliths, in our view, few studies have tried to overcome this kind of typological or ethnic interpretation, trying to explore which role microlithic tools covered for the human communities that produced and use them. In fact, to understand how microliths act both as artifacts and symbolic elements, the first step is to contextualize them inside their environmental of use, trying to understand how and how much they participate in the local economic system. Thus, microwear analysis should be considered, as well as technology, raw material procurement, faunal and archaeobotanical data, as a key study for the understanding of the entire problematic.

Even if some works of synthesis are available (Elston and Kuhn 2002), and have been recently published interesting studies concerning functional aspects, principally for Epipalaeolithic and Mesolithic period (Cristiani, Pedrotti and Gialanella 2009; Yaroshevich 2010), data available for Neolithic is still controversial (Martínez 2004; Longo and Isotta 2007; Lea, Gassin and Linton 2009; Lo Vetro, Martini and Mazzucco 2009). Nevertheless, microliths, as

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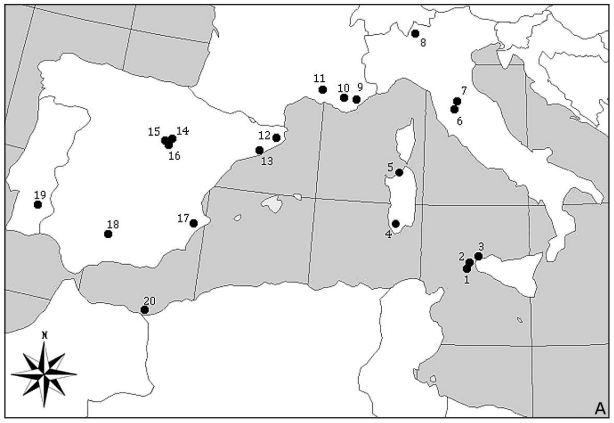
guide fossils, historically covered a relevant part in defining some of the crucial phases of the period (e.g. double-bevelled segments; symmetric concave trapezes, trapezes with *piquant-trièdre*; rhomboids, etc.). Particularly, for early Neolithic, microliths have been often interpreted in terms of "archaic" and "innovative" features, basing this consideration on the comparison between Mesolithic and Neolithic assemblages, hypnotizing mutual influences between prehistoric communities.

Through a large sample of sites from different environmental and economical contexts in the Western Mediterranean, comprised between the V and VI millennium BC, we intend to afford this problematic from an integrated point of view, contextualizing functional data inside a larger broader context. Our objective is to prove if there is or not any kind of recurrence in microliths use during Early Neolithic and if it possible to identify any kind of correlation between tools use and environmental and economical background. Evaluate which role microliths had in early Neolithic subsistence economy, is, in our view, the first step in order to discuss their significance also on a symbolic level, as meaning of cultural identities and technological traditions. In this sense, we hope we could contribute to the understanding of how ideas and technological schemes were diffused and exchanged from populations to populations during Neolithic.

Materials & Methods

The analyzed area includes sites from Italy, France, Spain and Portugal (fig. 1A). The chronological range runs between the beginnings of the VI millennium to the second half of the V (fig. 1B). This selection let us analyze the uses of microliths in respect of a gamma of different environments, facing a complex mosaic of cultural landscapes. In this scenario, microlith production, use and distribution, could offers additional data about some fundamental and basic aspects of the economic activities and organization.

A total of 325 instruments were analyzed, mostly geometric microliths: trapezes and secondarily triangles and segments. Wear traces have been registered following the method proposed by Newcomer and Keeley (1979), Odell and Odell-Vereeken (1980) and Fischer, Vemming Hansen and Rasmussen (1984).



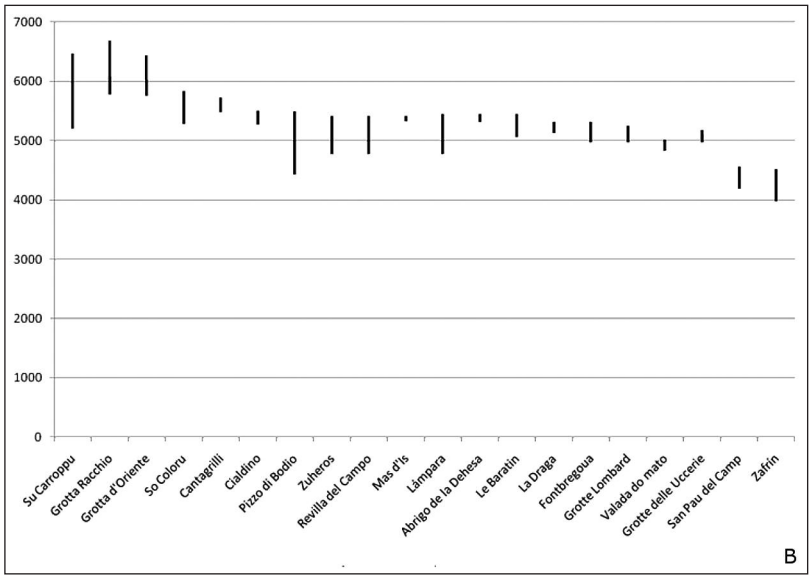


FIGURE 1. Geographical distribution & indicative chronology: 1) Grotta delle Uccerie (Martini *et al.* in press b); 2) Grotta d'Oriente (Martini *et al.* in press c); 3) Grotta Racchio-Gruppo dell'Isolidda (Martini *et al.* in press a); 4) Su Carroppu (Gassin and Lugliè in press); 5) So Coloru (Fenu, Martini and Pitzalis 1999-2000); 6) Cialdino (Fedeli, Filippi and Martini 2006; 7) Cantagrilli (Baglioni *et al.* in press); 8) Pizzo di Bodio (Banchieri 1990); 9) Grotte Lombard (Binder *et al.* 1991); 10) Fontbregoua (Binder 1987); 11) Le Baratin (Binder 1987); 12) La Draga (Bosch, Chinchilla and Tarrús 2008); 13) San Pau del Camp (Granados, Puig and Farré 1991); 14) Revilla del Campo (Rojo *et al.* 2008); 15) La Lámpara (Rojo *et al.* 2008); 16) Abrigo de la Dehensa (Rojo, Garrido and García 2006); 17) Mas d'Is (Bernabeu *et al.* 2003); 18) Murciélagos de Zuheros (Gavilán *et al.* 1996); 19) Vallado do Mato (Diniz 2007); 20) Zafrín (Rojo 2010).

Results & Discussion

Preliminary analysis seems to indicate a relation between microliths functional data and the settlements environment and typologies. Both environmental conditions (as climate, geographical position and available natural resources) and the typology of the occupation (durability, seasonality, size, etc.), as well its eventual specialization (camp sites, crafting areas, domestic spaces, animal recoveries, etc.) seems to influence microliths use and ratio. Three macro categories have been individuated:

1) Settlements located in mountainous or high-hill areas. Those sites are characterized by a relevant component of hunting and foraging activities. Here microliths are strongly linked to hunting activities, as part of arrows or composite projectiles.

- The Tuscan settlements of Cantagrilli and Cialdino are some of the most ancient Neolithic contexts of the northeaster Tuscany. The former, located on Monte Cantagrilli, it has been interpreted as a mid-altitude campsite of brief duration, probably devoted to hunting activities and maybe associated to raw material circulation. It is characterized by a lithic assemblage resembling Castelnovian traditions, with a prevalent bladelet production (Baglioni *et al.* in press). The association with some undecorated ceramic fragments and the presence of some obsidian instruments still suggests Neolithic influences. Microwear analysis agrees with the interpretation with a number of trapezoidal and triangular microlith (25% of the ret. tools) showing use-wear traces as projectile points for foraging activities (fig. 2B). The latter, Cialdino it is an open-air site situated on the Appennino Toscano-Emiliano, on a fluvial terrace of Santerno River. Faunal and archaeobotanical data are currently under consideration (Fedeli, Filippi and Martini 2006). In respect to Cantagrilli it shows a lithic assemblage in which, as whole, Mesolithic aspects seem evanescing. Anyway, microliths (24% of the ret. tools) still indicate similarities with Castelnovian assemblages. Microwear analysis seems to indicate that foraging activities still maintained an important role in the local economy, as instruments have been interpreted principally as part of projectiles (fig. 2C).
- The French settlements of Fontbregoua and Grotte Lombard have offered interesting data about microlith use and their relation with foraging activities. Fontbregoua is a cave situated in the inner Provence (Var). It was occupied during the early and late Cardial (Binder 1987) as a sheep pen and as a place for pro-

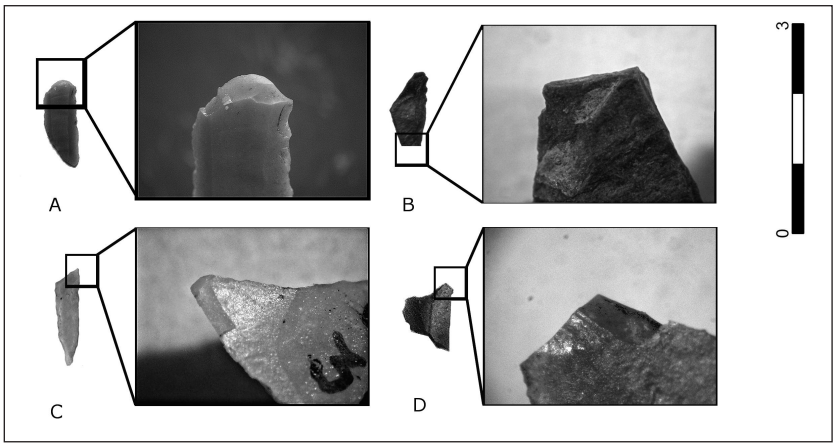


FIGURE 2. Microliths used as projectile points: A) Backed segment from Revilla del Campo, with an extensive fracture. B) Triangle from Cantagrilli with step and spin-off fractures. C) Narrow triangle point from Cialdino with a small impact fracture. D) Trapeze from Grotta Racchio with a small impact fracture.

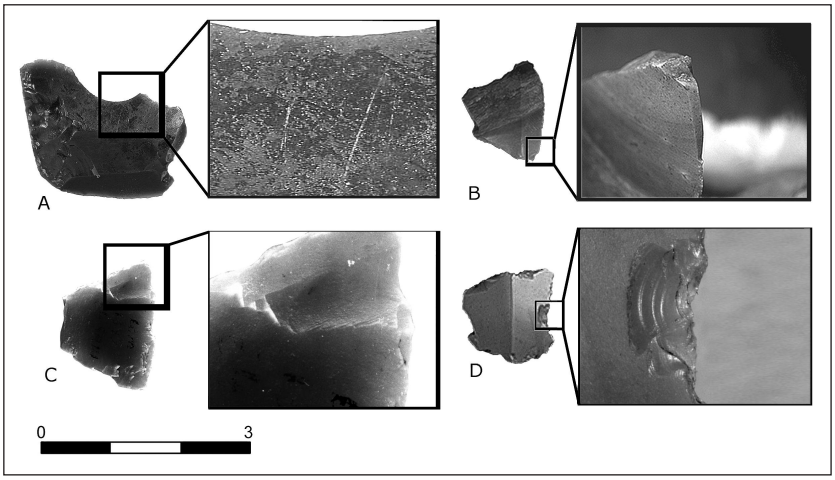


FIGURE 3. Microliths used as transversal points: A) Obsidian trapeze from Su Carroppu showing impact fracture and striations. B) Trapeze from San Pau del Camp, showing a burin-like fracture. C) Trapeze from Grotte Lombard showing an elongated step fracture. D) Trapeze from Pizzo di Bodio with step and hinge fractures.

cessing hunted animals. The proportion of wild animals remains vary from 26% to 85%, with a higher proportion in the late Cardial levels (Helmer 1984). Projectile points are numerous (39% of the ret. tools in the early Cardial levels) and about the 50% shows impact fractures (fig. 3C). The Grotte Lombard (Grasse) is a little shelter which was occupied by a group of hunters of the late Cardial culture. Geometric projectiles reach 50% of the retouched tools, with a high proportion of impact fractures (50%). Wild animals probably represent 100% of the fauna remains, as the domestic species remains (15%) have recently been dated from a later occupation of the shelter (Binder and Sénépart 2010). It can be considered as a specialised hunting camp. Different species have been hunted, among which mainly red deer (Binder *et al.* 1991).

- In the Iberian Peninsula microliths production seems quite heterogeneous, varying in relation to the cultural, economical and environmental background. The Abrigo de la Dehesa (Soria), is a rock shelter situated in a hilly area at about 1000m asl., principally used as sheep pen and as recovery for shepherds (Rojo, Garrido and García 2006). Here human communities, aside pastoral activities, continued practicing hunting as the high number of microliths used as projectile (14,5%) seem to indicate. Anyway, if in the northern and central Spain, particularly in high-hills and mountainous environments, microliths seems to maintain a hunting vocation, in the southern regions projectile points are almost absent, regardless the settlement type and its environmental context. An example is the Cueva de los Murciélagos (Córdoba), a cave located on a 1000m high mountain, in the Sierras Subbética (Gavilán *et al.* 1996). It has been used as shelter for cattle and domestic space. Lithics were principally involved in crafting and domestic activities, as hide processing and butchering, while geometric microliths are marginal and barely used (2,7% as projectile).

2) Settlements situated on islands. Those sites seem to be characterized for a bigger variability in microlith uses and ratio. Even if some indications of hunting activities are present, is more difficult to precisely assess how these instruments participate to local economy. A wide gamma of foraging, hunting and farming activities are supposed for those contexts, through an exploitation of both marine and terrestrial resources.

- The Sicilian coastal settlements of Grotta Racchio (Trapani) (Martini *et al.* 2010a), Grotta delle Uccerie (Favignana) (Martini *et al.* 2010b) and Grotta d'Oriente (Favignana) (Martini *et al.* 2010c), have been interpreted as seasonal occupation, principally associated to the exploitation of marine resources and secondarily to hunting and to rudimentary grazing activities (Colonese *et al.* 2009). Zooarchaeological data available for Sicilian Mesolithic-Neolithic transition, indicate a gradually decrease in terrestrial faunal resources, probably due to an overexploitation (Mannino and Thomas 2010). Scarce large mammal remains characterized indeed the late Mesolithic and early Neolithic phases of Grotta d'Oriente and Grotta Racchio. Thus, in those contexts, exploitation of marine molluscs could have been a consequence of a depression in available resources (Colonese *et al.* in press). Lithic industries seem to preserve, on the basis of a typo-technological analysis, Castelnovian traits (Martini *et al.* 2009), and it is not, for the Mesolithic-Neolithic transition, abundant. Microliths ratio is as well low (3% of the ret. assemblage). Even if there is some evidences that in those sites microliths participate in hunting (fig. 2D), both zooarchaeological and lithic data suggest that hunting should not occupy a prominent position during early Neolithic phases.
- The Sardinian settlement of Su Coloru (Sassari) shows an extensive Neolithic stratigraphic sequence (Fenu *et al.* 1999-2000; Sarti *et al.* in press). Microliths are quite scarce along the entire series. Function seems here diversified: microwear analysis indicates uses as cutting insert, as sickle blade and as well as projectile point, whiteout any clear pattern of standardized utilization, even because of its low ratio (7% of ret. tools). Su Carroppu (Cagliari) is a rock-shelter situated at 350m asl. on a little mountain massif. The ancient layer, excavated on a very limited surface, belongs to the Geometric Cardial Ware Style. The lithic industry is distinguished by a remarkable incidence of obsidian geometric pieces (65% of the obsidian ret. tools) principally used as projectiles (75%) (fig. 3A). Yet, a low number and ratio of wild fauna remains occur in the site, all belonging exclusively to small game. Hunting of feral domestic animals (sheep, goats or pigs) has been hypothesized (Gassin and Lugliè in press).
- The Chafarinas Islands, in the north-eastern Africa, have been extensively occupied by human populations, as during Neolithic the sea level was lower and a land bridge connected the Archipelago to the continent. Excavations carried out in Zafrín (Melilla) suggest that the predominant economical practices have been grazing and marine resources gathering (Rojo 2010). As for Portugal and southern Spain here microliths are not well represented (4,7% of ret. assemblage).

3) Settlements in plains, floodplains, near lake basin or low-hill areas. Agricultural and farming practice seems here to occupy a stable and leading position inside the local economic system. Microliths ratio is generally low, and their use principally linked to hunting, probably as a supplement to farmer's productive activities.

- The Varese lakes area is characterized by a number of early and late Neolithic coastal settlements. Among those, Pizzo di Bodio (Varese) covers an extensive area

on the south-western shore. Here, microliths don't represent quantitatively an important group (3% of the ret. assemblage). Microwear analysis indicates that just a part of them was used as projectile points (fig. 3D). Among the wild fauna remains the most representative are red deer and roe deer (12,6%). These data suggests that hunting activities were just a part of a larger and complex economic system in which gathering, grazing and farming were as well implicated. A mixed economic system well suits with the high biodiversity that characterized Varese lakes around the end of the VI millennium (Banchieri 1999, 2009).

- The French site Le Baratin is an open air Cardial settlement (Vaucluse). It probably shows a sedentary occupation with house building, lithic production and agro-pastoral activities (Sénépart 2009; Gassin, Binder and Sénépart 2004). Wild animals are almost absent in the faunal remains. Geometric microliths reach 23% of the retouched tools (Binder 1987), still with a low ratio of impact traces (14%).
- In Iberian Peninsula, in settlements situated in plains or valleys, in which agricultural and pastoral activities are already consolidated, microliths seem to cover a secondary position in respect to the overall lithic production, showing lower percentages: La Lámpara (Soria) 2,3% and Revilla del Campo (Soria) 5,6% (Rojo *et al.* 2008); La Draga (Girona) 5,3% (Bosch, Chinchilla and Tarrús 2000); Sant Pau del Camp (Barcelona) – postcardial level – 7% (Gibaja 2008; Molist, Vicente and Farré 2008); Mas d'Is (Alicante) 0,5% (Bernabeu *et al.* 2002). In those contexts projectiles are scarcely used (fig. 2A; fig. 3B), while generally productive activities, as hide treating and cereal harvesting, are predominant. The only site that breaks this scenario, is Valada do Mato (Évora), in which microliths are one of the most representative elements (34% of the ret. assemblage) (Diniz 2007). Nevertheless, this is a peculiar settlement, in which apparently Mesolithic technological tradition still play an important role and agriculture practices do not seem to be fully developed.

Conclusions

On a preliminary analysis, microliths use and distribution over Western Mediterranean Basin during VI-V millennium BC seem associated to a number of factors, strictly correlated each others. Chronological, environmental, technological and cultural aspects all influence. To better understand microliths role is thus necessary to in-depth contextualize those instruments inside their environment of use.

Our analysis indicates that microliths were principally used as part of projectiles, principally as points or transversal points. Thus, they could represent a good index of the hunting activities realized in the site area. Still to investigate is the possible relation between microliths shapes and game size (e.g. small game or large game hunting; birds hunting; etc.), as archaeological data is actually controversial. Other uses are also possible, but evidences are not enough to support any systematic use. However, in the analyzed contexts, microliths cannot be considered polyfunctional instruments. In some contexts they may have been used for other tasks – e.g. crafting activities – but it is not a generalized trend.

Our study also indicates that in some contexts, microliths production is limited independently from the environmental and economical context. Even in those sites apparently devoted to foraging activities microliths have been found sporadically. In these sense, the absence of microliths seems to reflect a cultural choice. Also in coastal environments, particularly on islands, microliths seems to be slightly employed. Moreover, their presence seems scarcely justifiable on the basis of economic and environmental condition, as they do not to cover a specific role inside the local economy. Yet to investigate are possible uses for fishing or molluscs gathering: more experimentation is needed.

Even if more data have to be integrated in the study and the sample have to be extended, microliths significance during Neolithic in the Western Mediterranean seem to respond to a number of different patterns, principally on the basis of environmental variation, but also in relation to cultural and technological choices. However, even if, on a functional level, we partially notice a certain degree of homogeneity in tools uses independently from their morphometrical and technological features – letting us hypothesize some kind of uniformity in hunting techniques, at least around the end of the VI millennium – , is still difficult to assess wherever variation in microliths represent or not a cultural switch, a technological adaptation, as result of particular knapping strategy, or a mix of both. Future studies will proceed in this direction.

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